

SHIP PRODUCTION COMMITTEE  
FACILITIES AND ENVIRONMENTAL EFFECTS  
SURFACE PREPARATION AND COATINGS  
DESIGN/PRODUCTION INTEGRATION  
HUMAN RESOURCE INNOVATION  
MARINE INDUSTRY STANDARDS  
WELDING  
INDUSTRIAL ENGINEERING  
EDUCATION AND TRAINING

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# **THE NATIONAL SHIPBUILDING RESEARCH PROGRAM**

## **Proceedings of the REAPS Technical Symposium**

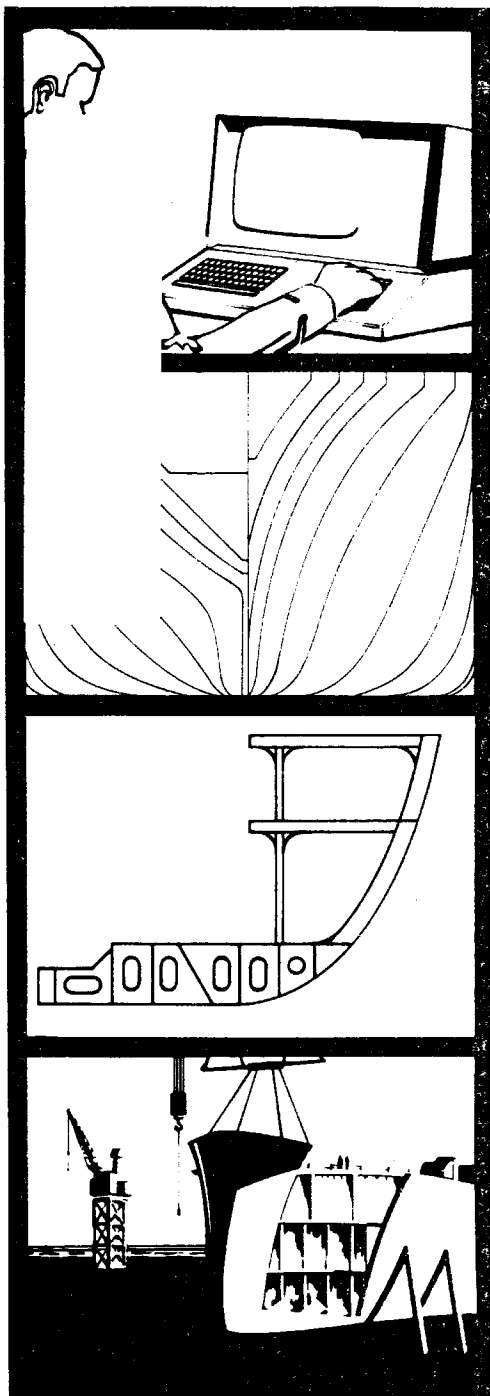
### **Paper No. 17: Users Experience with REAPS Simplified ALKON**

U.S. DEPARTMENT OF THE NAVY  
CARDEROCK DIVISION,  
NAVAL SURFACE WARFARE CENTER

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**R** ESEARCH  
**E** AND  
**E** NGINEERING  
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**P** AND  
**S** RODUCTIVITY  
IN  
SHIPBUILDING

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USER EXPERIENCE WITH REAPS SIMPLIFIED ALKON

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Mr. Breen has a B.S. degree in Mathematics and Computer Sciences from Purdue University.

## 1. WHAT IS ALKON?

### A PARTS GENERATION SOFTWARE SYSTEM

- AUTOKON 1: PARTS GENERATION
- AUTOKON '71/'76: ALKON
- REAPS: SIMPLIFIED ALKON

GENERAL DYNAMICS

## 3. WHAT IS SIMPLIFIED ALKON?

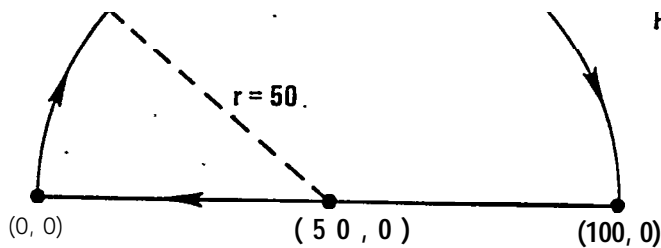
- AUTOKON '71 ALKON

1. AUTOKON 1 PARTS GENERATION  
BY SOFTWARE ENHANCEMENTS  
TO AUTOKON '71  
BY INCLUSION OF  
SPECIALIZED NORMS

GENERAL DYNAMICS

## 2. SPT (+0+0)

CIR: CNT(+50+0)  
RAD (-50) EPT (+100+0)  
SL: EPT (+0+0)



GENERAL DYNAMICS

## 4.

## SIMPLIFIED ALKON

A METHOD OF OFFERING A RELATIVELY SIMPLE  
PARTS GENERATION LANGUAGE FOR N/C FLAME  
CUTTING DEMANDS WHILE SIMULTANEOUSLY.  
ALLOWING A SOPHISTICATED LANGUAGE FOR  
DESIGN AND ADVANCED MANUFACTURING  
REQUIREMENTS

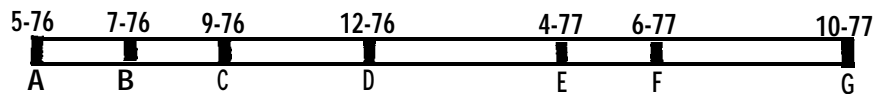
GENERAL DYNAMICS

## HOW HAS SIMPLIFIED ALKON BEEN DEVELOPED?

- APPROVED AS A REAPS DISCRETIONARY  
DEVELOPMENT PROJECT IN 1976
- JOINT EFFORT BETWEEN IIT RESEARCH  
INSTITUTE AND GENERAL DYNAMICS CORP.

GENERAL DYNAMICS

## IMPLEMENTATION SCHEDULE



- A: PRELIMINARY SPECIFICATIONS
- B: REAPS PARTICIPANTS' COMMENTS
- C: REVISED SPECIFICATIONS
- D: DISTRIBUTION OF BX2
- E: REVISED REQUIREMENTS
- F: DISTRIBUTION OF BX3
- G: DISTRIBUTION OF BX4

GENERAL DYNAMICS

## WHY SIMPLIFIED ALKON?

- TRAINING
- TURN-AROUND
- ADDITIONAL CAPABILITIES
- SOFTWARE MAINTENANCE AND MODIFICATIONS
- COMPUTER MAINFRAME FACETS

GENERAL DYNAMICS

## TRAINING

### AUTOKON '71 ALKON

- BASIC - 6 WEEKS AT 20 HOURS/WEEK  
DOES NOT ALLOW FULL CAPABILITY NORM CODER
- ADVANCED - 4 WEEKS AT 20 HOURS/WEEK  
INCLUDES CONCEPTS SUCH AS WIRE MODELS,  
GOES BEYOND CAPABILITIES OF AUTOKON 1,  
ALLOWS NORM CODING PENDING USER

### AUTOKON 1 PARTS GENERATION

- 2 WEEKS AT 20 HOURS/WEEK  
FULL PRODUCTION CODER  
ALLOWS NORM CODING PENDING USER  
CAN BE LEARNED BY "HAMMER AND  
NAIL" LOFTSMEN

GENERAL DYNAMICS



## TURN-AROUND

NUMBER OF JOB SUBMISSIONS REQUIRED  
PER SUCCESSFUL MANUSCRIPT

- AUTOKON '71 ALKON: 3-5 SUBMISSIONS
- AUTOKON 1 PARTS: 2-4 SUBMISSIONS

GENERAL DYNAMICS

## ADDITIONAL CAPABILITIES

ALL AUTOKON '71 ALKON FACETS  
ARE AVAILABLE TO THE AUTOKON 1  
PARTS GENERATION CODER

GENERAL DYNAMICS

## SOFTWARE MAINTENANCE AND MODIFICATIONS

- AUTOKON '71 ALKON:
  - THREE-PASS SYSTEM
  - A DATA BASE RECORD INCLUDES ALL RELATED MATRIX DATA
  - REAPS/IIT RESEARCH INSTITUTE SUPPORTED
- AUTOKON 1 PARTS GENERATION:
  - SIX-PASS SYSTEM
  - A DATA BASE RECORD IS COMPRISED OF A SINGLE GEOMETRIC CONTOUR

GENERAL DYNAMICS

# COMPUTER MAINFRAME FACETS:

FACET	AUTOKON 1 PARTS	AUTOKON'71 ALKON	SIMPLIFIED ALKON
MEMORY	64K WDS	49K WDS	53K WDS
MASS STORAGE	2.2 MIL. WDS	1.7 MIL. WDS	1.7 MIL. WDS
CPU TIME:			
1 PART	13.6 SEC	4.6 SEC	4.8 SEC
5 PARTS	27.4 SEC	18.3 SEC	22.1 SEC
20 PARTS	81.6 SEC	60.6 SEC	75.3 SEC

GENERAL DYNAMICS

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